

CLAIMS

- 1.- A method to obtain an immunogenic, non-haemolytic *Actinobacillus pleuropneumoniae* strain from a virulent App strain characterized by comprising the following steps:
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- The transmembrane domains of the Apx haemolytic and cytolytic exotoxins are identified.
  - At least, one segment of the *apxIA* gene and optionally a segment of the *apxIIA* gene, which code a transmembrane domain of the

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  - haemolytic and cytolytic Apx exotoxins is modified.
- 2.- A method, according to claim 1 characterized by introducing a deletion in at least one segment of the *apxIA* gene and optionally in a segment of the *apxIIA* gene, which code a transmembrane domain of
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- the Apx haemolytic and cytolytic exotoxins.
- 3.- A method according to claim 2 characterised by introducing a deletion in the segment of the *apxIA* gene, which codes a second transmembrane domain of the App ApxI exotoxin.
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- 4.- A method according to claim 3 characterized by introducing a deletion of nucleotides 885 to 944 of the *apxIA* gene, which codes the second transmembrane domain of the App ApxI exotoxin .
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- 5.- A method according to claim 4 characterized by introducing furthermore, a deletion in the segment of *apxIIA* gene, which codes the second transmembrane domain of the App ApxII exotoxin.
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- 6.- A method according to claim 5 characterized by introducing a deletion of the nucleotides 885 to 944 of the *apxIIA* gene, which code the second transmembrane domain of the App ApxII exotoxin.
- 7.- An *Actinobacillus pleuropneumoniae* strain obtained according to

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the method described in any of the claims, from 1 to 6.

5 8.- A vaccine against porcine pleuropneumonia characterized by comprising an *Actinobacillus pleuropneumoniae* strain obtained using the method described in any of the claims from 1 to 6.

10 9.- The immunogenic and non-haemolytic strain of *Actinobacillus pleuropneumoniae* deposited in the Colección Española de Cultivos Tipo with the registration number CECT 5985 or a mutant thereof.

10.- A vaccine against the porcine pleuropneumoniae characterised by comprising the strain of *Actinobacillus pleuropneumoniae* according to claim 9.

15 11.- The immunogenic and non-haemolytic strain of *Actinobacillus pleuropneumoniae* deposited in the Colección Española de Cultivos Tipo with the registration number CECT 5994 or a mutant thereof.

20 12.- A vaccine against porcine pleuropneumonia characterized by comprising a strain of *Actinobacillus pleuropneumoniae* according to claim 11.

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